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COUNTRY Yugoslavia REPORT [redacted]

TOPIC The Yugoslav Railway System

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REMARKS

The attached chart of the network of Yugoslav RR lines is based on the evaluation of all available records, summarizing a number of previous reports * which deal in detail with the individual RR lines of the country (see Annex 1). Generally, the following remarks on the Yugoslav railway system may be made.

1. Net of the Railroad Lines

25X1 a. Historical and political factors: The structure of the Yugoslav railway system was shaped by the historical development of this state founded after World War I and by the geographical conditions of the country.

In those districts of the country formerly part of Imperial Austria the construction of RR lines was designed to suit only Austro-Hungarian interests, and so these lines had little or no connection with RR lines in Serbia, Macedonia, and Montenegro, which at that time, already enjoyed independence. One of the main tasks of the newly established state was therefore to integrate the railway nets of the various provinces forming the new state. This was a slow process, for only 1,100 km of new RR lines were constructed from 1918 to 1940. The prolonged occupation of the country (from 1941 to 1944) by Germany, Italy, and Bulgaria interrupted this integration of the railway system, although much was done in the field of railroad construction work during that period by the various occupation powers. After the German surrender, when the independence of the country was restored within her former borders, which were extended to include former Italian and Austrian territory, the Tito regime resumed the work of unifying the Yugoslav railway net. Considerable results were achieved through enormous effort. From 1946 to 1948, not only were the considerable war damages repaired but 1,000 km of new RR lines were also built, an effort which roughly corresponds to the 22-year achievement of prewar Yugoslavia. Although this result, which was pushed for propaganda reasons, was frequently reached at the expense of the quality of the work performed, it is nevertheless remarkable.

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b. Geographical conditions: Apart from political and historical factors, it is chiefly the geographical condition that influenced the structure of the Yugoslav network of railways, forcing the lines in certain directions, and simultaneously limiting railroad construction projects. The open terrain of northern Yugoslavia favors east-west transit traffic and permits the construction of numerous local RR lines. The zone of river basins in eastern Serbia and Macedonia (Morava and Vardar valleys) offered facilities for the construction of RR connections to the east (Bulgaria and Turkey) and south (Greece). Thus, the most important RR connection of the country, that from ZAGREB (AUSTRIA) via BEOGRAD (BELGRADE), LAPOVO, NISH to SOFIA, and CO STANTINOPEL from LAPOVO via NISH or KRALJEVO - SKOPLJE to SALONIKI, follows a course suggested by natural terrain features. The mountainous center of the country between these open river valleys, the "Dinaric Region", made the construction of a continuous railway net very difficult. This region is therefore poor in RR lines. The few existing lines are narrow-gauge lines (760mm) of very limited load capacity, frequently blocked in winter or after bad weather. They do not represent adequate feeder lines to and from the Adriatic sea ports. This barrier separating sea and inland traffic constitutes the basic weakness of the Yugoslav traffic system. The efforts of the Yugoslav Government to overcome this weakness will be dealt with in detail in section 2 of this study ("Construction Plans").

c. Network of railways: Prior to World War II, the Yugoslav railway net amounted to 9,650 km, two thirds of which was standard-gauge, the remainder narrow-gauge lines of 760 mm, and sometimes also of 600 mm (in the area of SKOPLJE). The bulk of the RR lines was single tracked. As to its type of construction and its maintenance it only partly corresponded to Central European standards. The subgrade was lighter, the rails used were not so heavy, and automatic safety and signal installations were available only on trunk lines. The utilization of the air brake for freight trains was not made compulsory on trunk lines before 1948. The capacities of the RR stations and lines are therefore inferior, for example, to that of corresponding German lines. For this reason the Germans, during World War II, devoted more attention to the improvement of existing lines than to the construction of new lines in accordance with their military and economic interests. During the German retreat in 1944/45 the RR installations suffered major damages. Nearly 50 percent of the RR lines and 68 percent of the bridges with spans over 30 m were destroyed or damaged. By a ruthless employment of PWs and of the civilian population, above all the youth, most of the war damage was repaired and new RR lines were constructed, being converted from narrow to standard gauge.

Late in 1948 Yugoslavia had a trackage of 10,690 km, including the newly acquired Austrian and Italian districts (see Annex 1). As pointed out in para 1 b., the railway net has its greatest density in the open north and southeast, the JESENICE or LJUBLJANA-ZAGREB-BELGRADE-LAPOVO-NISH or KRALJEVO-SKOPLJE transit line being the backbone of the railway system. This line has a great carrying capacity because large sections of it are double tracked (JESENICE or LJUBLJANA - ZAGREB, NOVSKA-BELGRADE, VELIKA PLANA-LAPOVO sections); others, such as those between ZAGREB

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and NOVSKA, BELGRADE and VELIKA PLANA, LAPOVO and SKOPLJE, VELES and the Greek border, may be considered as such due to the existence of two single-track lines running separately. The northern part of the country is rich in single-track local RR lines also establishing connections with Hungary and northern Rumania. The connection to Bulgaria is established by only one single-tracked but well equipped line running from NISH to SOFIA. Two single-track RR lines, which branch out at VELES, leading to SALONIKI via GEVGELIJ and PLANA constitute the connections with Greece. There is no RR connection with Albania. Construction plans in this direction have probably been shelved due to the present political situation. In the "Dinaric Region" leading to the Adriatic Sea, only two RR lines are of importance, viz.:

(1) The single-track standard-gauge line connecting the area of ZAGREB (AGRAM) with the important Adriatic ports of SIBENIK and SPLIT (SPALATO), which in 1948 was considerably improved by the construction of the standard-gauge KNIN-KNIN line (so-called "Una Line") (see previous reports **).

(2) The single-track line DOBOJ-SARAJEVO-OSTRA to DUBROVNIK (RAGUSA) with a branch line leading to the port of PLOCA in the west. This formerly narrow-gauge line (760 mm), which originated in SLOVENSKO, was partly converted into a standard gauge line in 1947, (section from DOBOJ to SARAJEVO) and simultaneously extended in the north beyond DOBOJ as far as SAMAC, which now serves as its starting point (another report ***). Its southern half, still narrow-gauge track, is still furtherrestricted in its importance by the existence of a rack railway section between BRADINA and KONJIC, south of SARAJEVO, where this line has to overcome a steep grade about 15 km long.

All the major Yugoslav RR lines, as far as reliable records were available, are dealt with in detail in other reports.*2

2. Construction Plans

After repair of major war damage, the Tito Government, with all the elan of authoritarian regimes, began improving the existent railway net through a large-scale construction program or conversion of narrow-gauge lines to standard gauge, paying little regard to costs and economy. The work was pushed by ruthless mass employment of civilian labor brigades, mostly juveniles, political internees, and PWs. Since the work performed was very often of poor quality, thorough overhauling of some of the newly constructed lines was necessary shortly after they were opened. The construction program is based on military and economic considerations, the chief aims being the achievement of a greater net density in the "Dinaric Region", improvement of the RR connections to the Adriatic Sea, the creation of strategic lines along the borders, and the removal of operational bottlenecks. Since the end of the war, the following lines have been constructed, converted to standard gauge, or are still under construction.

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[redacted]

a. SAVAC - SARAJEVO line (length 240 km): Partly newly constructed as a standard-gauge line, partly converted from narrow to standard gauge. The goal is the construction of a line to the Adriatic Sea surpassing the capacity of the previously existent lines. Its eventual extension to the Adriatic Sea is probable [redacted]

25X1

b. BRCKO - BANOVICI line (length, 90 km): Single-track standard-gauge line serving as an interconnection of two existent lines [redacted] and opening up the BANOVICI industrial region.

25X1

c. BIHAC - KNIN line (length, 112 km): Single-track standard-gauge line, supplementing what was formerly the only standard-gauge connection to the Adriatic Sea. It established a railroad connection between the grain producing basins of VOJVODINA, POSAVINA, PODRAVINA and the Adriatic ports of SIBENIK and SPLIT. It is of equal military and economic importance [redacted]

25X1

25X1 [redacted]

d. NIKSIC - TITOGRAD (PODGORICA) line (length, 40 km): Newly constructed as a single-track narrow-gauge line (760 mm) with a roadbed permitting the laying of a standard-gauge track, interconnecting two previously existent narrow-gauge lines, also of 760 mm gauge. It is the only line in this area (the former Montenegro) and therefore of economic, political, and military importance. Its intended extension into Albania will hardly be carried out in the foreseeable future due to the rising political tension [redacted] between the two states.

25X1

e. SABAC - ZVILJACA line (length, 54 km): Conversion of the narrow-gauge line (760 mm) to standard gauge; probably of predominantly military importance since it was built by army units, [redacted].

25X1

f. STOBIJA - PRIZREN line (length, 56 km): Newly constructed single-track standard-gauge line, branching off from the PEC-KOSOVO line in the direction of Albania, following the "White Drave" valley to the south. Originally, it was to run as far as KUKUS, Albania, a goal which had to be temporarily abandoned because of political reasons. This project is of economic importance inasmuch as it opens up the important TREPCA mining district, but its political and military importance must not be overlooked [redacted]

25X1

g. KURSUMLICA - PRISTINA line (length, 68 km): Newly constructed single-track standard-gauge line establishing a valuable cross-connection between the two single track sections of the main through line from BELGRADE via ZAPOVO and NISH or KRALJEVO-to SKOPLJE [redacted]

25X1

h. SKOPLJE - TETOVO - GOSTIVAR line (length, 60 km): Conversion of a previously narrow-gauge (600 mm) line to standard gauge, running along the eastern border of Albania, therefore of predominant strategic importance. Possibly the conversion of the remaining narrow-gauge section as far as OHRID will be effected later on [redacted]

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i. KUMANOVO - STIP line (length, 70 km): Newly constructed single-track standard-gauge line connecting the eastern branch of the NISH-SKOPLJE truck line with the spur line leading to the Bulgarian frontier. Probably constructed with the view of easing the traffic burden of the SKOPLJE RR juncture, it is also of military importance [redacted] 25X1

j. KUCEVO - BRODICE line (length, 16 km): Continuation of a single-track standard-gauge line in the direction of the Rumanian border; of predominantly economic importance because it opens up the extensive pine woods near KUCAC but also of strategic importance [redacted] 25X1

k. BELGRADE - OVCA - PA CEVACKI KIT line (length, 35 km): Newly constructed single-track standard-gauge spur line into a rich agricultural district supplying BELGRADE (see another 25X1 [redacted].

l. SCZAKA - DUTOLJE loop (length, 8 km): Newly constructed single-track standard-gauge line made necessary by the fixing of the Italian - Yugoslav border; it is to interconnect two RR lines cut by the new boundaries ([redacted] 25X1

m. Reconstruction of the BELGRADE RR junction: In its present state, the BELGRADE RR junction is a bottleneck for the entire rail net through-traffic of the norther part of the country. Hemmed in by the hills between the Danube and Save Rivers, it does not offer any possibilities for makeshift improvements. Only by a large-scale reconstruction project separating local from through-traffic will it be possible to eliminate the present difficulties. Work on this important project, which will bring about a basic reorganization of rail operations in this area, has started within the framework of the five-year plan. Special freight lines are to reroute bulk through-traffic around the capital, and a new marshalling yard in ZELEZNIKO POLJE is to ease the strain on the BELGRADE RR station. Part of the former railway installations in the center of the city will be removed in order to make room for other constructions. Three new RR bridges (two across the Save River and one across the Danube River) in addition to 9 tunnels are scheduled for construction in connection with this project. The southern Save River bridge near OSTRUZNICA, the 700 m tunnel near ZUJEVO, and the southwestern rerouting line have been under construction since the summer of 1948. Annex 2 shows the lay-out of the BELGRADE junction after completion of the reconstruction work. The duration of the construction work cannot be foreseen.

n. SKOPLJE RR junction; also a bottleneck on the main Yugoslav transit line, is also being improved, although on a much more modest scale than the BELGRADE RR station.

o. LUPOGLAV - STALIJE line (length, 55 km): Single-track standard-gauge line still under construction. It is of purely economic importance for the opening up of the coal basin of RASA-LABIN on the Istrian peninsula. The previously necessary transloading operations by shipping this coal via FIUME by sea are to be eliminated by this [redacted] line.

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In addition to the construction mentioned there are a great number of minor projects under way, all designed to raise the economy of the country in the fields of agriculture, industry, and forestry. A large number of other railroad lines are also scheduled for construction, but these projects are not yet off the drawing board and so need not be dealt with here. The speed of the realization of this railway construction program is being slowed down through the political differences between the Eastern Bloc and TITO, which led to a suspension of deliveries of rolled products, particularly of rails and girders, from Czechoslovakia and Poland. Since the capacity of the domestic steel industry is still far too low for the requirements of the country, TITO will sooner or later have to turn to the west if he wants to put his large-scale and vital construction projects into practice.

The five-year plan, which will run until 1951, laid down the following targets for the improvement of rail operations:

(1) Construction of RR lines:

standard-gauge:	1,157 km
narrow gauge:	900 km
total:	2,057 km

(2) Repair of locomotives and rolling stock:

standard-gauge locomotives:	450
narrow-gauge locomotives:	130
passenger cars:	2,000
freight cars:	14,500

(3) Manufacture of locomotives and RR cars:

locomotives:	2,000
passenger cars:	950
freight cars:	14,560

The manufacture and repair of the rolling stock and locomotives is being performed in the following RR shops:

Central RR workshop in MARIBOR
RR repair shop in ZIMLJANIN
RR repair shop in SARAJEVO
RR repair shop in NISH
RR repair shop in SMEDEROVO
RR repair shop in SUBOTICA
RR repair shop in ZAGREB
"14th October" RR Car Factory in KRUSEVAC
"Vasenica" RR Car Factory and Ironworks in SMEDEREVSKA PALANKA.

As was shown by experience in 1948, the targets mentioned in paras (2) and (3) will not be reached unless the domestic production capacity in this field is supplemented by imports of rolling stock or semi-finished products.

3. Traffic Performance

a. Only the train density achieved on the Yugoslav railroad trunk lines is up to Central European standards. They are dealt with in other reports *4. Due to considerable grades, curves, too short sidings, and the light subgrade or the type of rails used, only half trains can operate on many of the local standard-gauge lines. As to the narrow-gauge lines, it is a rule

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of thumb that the freight of two to three narrow-gauge trains corresponds roughly to a normal standard-gauge train.

b. The volume of rail traffic is increasing. In 1948 154,560,000 passengers were carried, which represents a 40 percent increase over 1946 and a 300 percent increase over the performance in 1938. The freight volume of 1948 surpassed that of 1938 by 79 percent. Detailed figures (in tons) are not available. Although the correctness of these press figures must be qualified since they may have been exaggerated for propaganda reasons, a steady increase of rail traffic cannot be denied. Special measures, such as the introduction of scheduled "route trains" have been taken with a view of reducing the time of circulation of the rolling stock to 4 days as compared with 12 days before the war. But in spite of all these measures the capacity of the Yugoslav railway system is still behind the traffic requirements of the country, which have risen considerably due to the progressing industrialization of Yugoslavia.

4. Organizational Set-up and Railway Personnel:

a. All the Yugoslav RR lines are state-operated. The railway system is centrally controlled by the "Directorate General, Railways," functioning within the Ministry of Traffic with its seat in BELGRADE. It works through regional agencies (Main RR Directorates and RR Directorates) in discharging its duties in the field of administration, construction work, and operations. The organizational set-up on all levels corresponds roughly to the system in use in western countries.

b. Reliable data on the numerical strength of the railway personnel is not available. It can be generally stated that there is an acute shortage of skilled personnel, particularly in the upper brackets. Only after years of systematic training will it be possible to overcome this shortcoming. In order to bridge the gap, many German railway officials who lost their jobs in Germany because of the de-Nazification law have been hired. They have already made a valuable contribution to the reconstruction and improvement of the Yugoslav railway system. This emergency measure is being supplemented by a long-range training program devised with a view of obtaining qualified replacements. The 24 technical railroad schools, including those in BELGRADE, PNCIVO, LJUBLJANA, NISH, ZAGREB, SARAJEVO, SUBOTICA, POLA, SKOPLJE, NOVI SAD, KASTAV near FIUME, CRVENI KRST near NISH, SMEDEREVO, ZRENJANIN, and others, were attended by about 5,000 railway employees in 1948. The courses at these schools last for three years and may be expected to turn out skilled personnel for all the various branches of railroad operations and administration. Following the Soviet example, Yugoslavia is employing an increasing number of women for railroad operations. These women not only work in administration, but are also employed as locomotive engineers, firemen, and mechanics in the shops. Also in the Soviet manner, special railroad brigades have been organized and standards of work performance have been laid down with the corresponding wage system based on personal achievements. That the TITO regime not only values record performance but also the quality of work performed is shown by the great intensity with which the technical training of the railway personnel is being pushed.

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5. Military Vulnerability of the Railway Net

a. The Yugoslav railway system in its capacity as a "traffic Bridge" to the Adriatic Sea and thus to the Mediterranean is of considerable importance to the Soviets, who are greatly interested in this region. Many construction projects are certainly due to Soviet initiative, although they are of equal importance to Yugoslavia. Since the present estrangement between the two countries may be of a temporary nature, the possibilities of the Yugoslav railway net for Soviet transit shippings are to be dealt with here, independent of the present situation.

b. The number of Soviet controlled RR lines leading into Yugoslavia is very small. In Greece, which need not be taken into account, because it is not Soviet-controlled, there are only two single-track RR lines from the area of SALONIKI to Yugoslavia. In Bulgaria there is only one single-track standard-gauge line from SOFIA in the direction of NISH. The connections with Rumania are limited to several single-track standard-gauge lines of minor capacity radiating from the northwestern district (TIMISOARA) and running north of the Danube River. More diversified and numerous are the RR connections with Hungary, but here also many of the lines are branch lines often suitable only for half-trains. Almost all of these approach lines, due to the mountainous character of the regions concerned, possess an unusually large number of bridges which may easily be destroyed and which would be very difficult to reconstruct because of their great height. There are not rerouting facilities at the southern Rumanian and at the Bulgarian and Greek frontiers. The railroad lines to the Adriatic Sea (one standard gauge line running from ZAGREB via KARLOVAC or BIHAC and KNIN to SPLIT in addition to the SAMAC-DOROJ-SARAJEVO-DUBROVNIK line, which is half standard and half narrow-gauge, are rich in bridges easily destroyed without any rerouting possibilities. Operations on these lines can therefore be interrupted with long-lasting effect. The military vulnerability of this narrow-gauge line is still further increased by the rack-railway section between BRADINA and KONJIC. A destruction of the few existent cog-wheel locomotives would eliminate this line for a prolonged period. The important through-line from ZAGREB via BELGRADE to SKOPLJE is very sensitive to air attack and sabotage because of its many large bridges across the Save, Danube, Morava, and Vardar Rivers. Additional air attacks on the still existing two bottlenecks of the BELGRADE and SKOPLJE junctions, would have a great effect on the entire railway system.

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2 Annexes: Yugoslavian Railways
Reorganization of the BEOGRAD (BELGRADE) RR Junction

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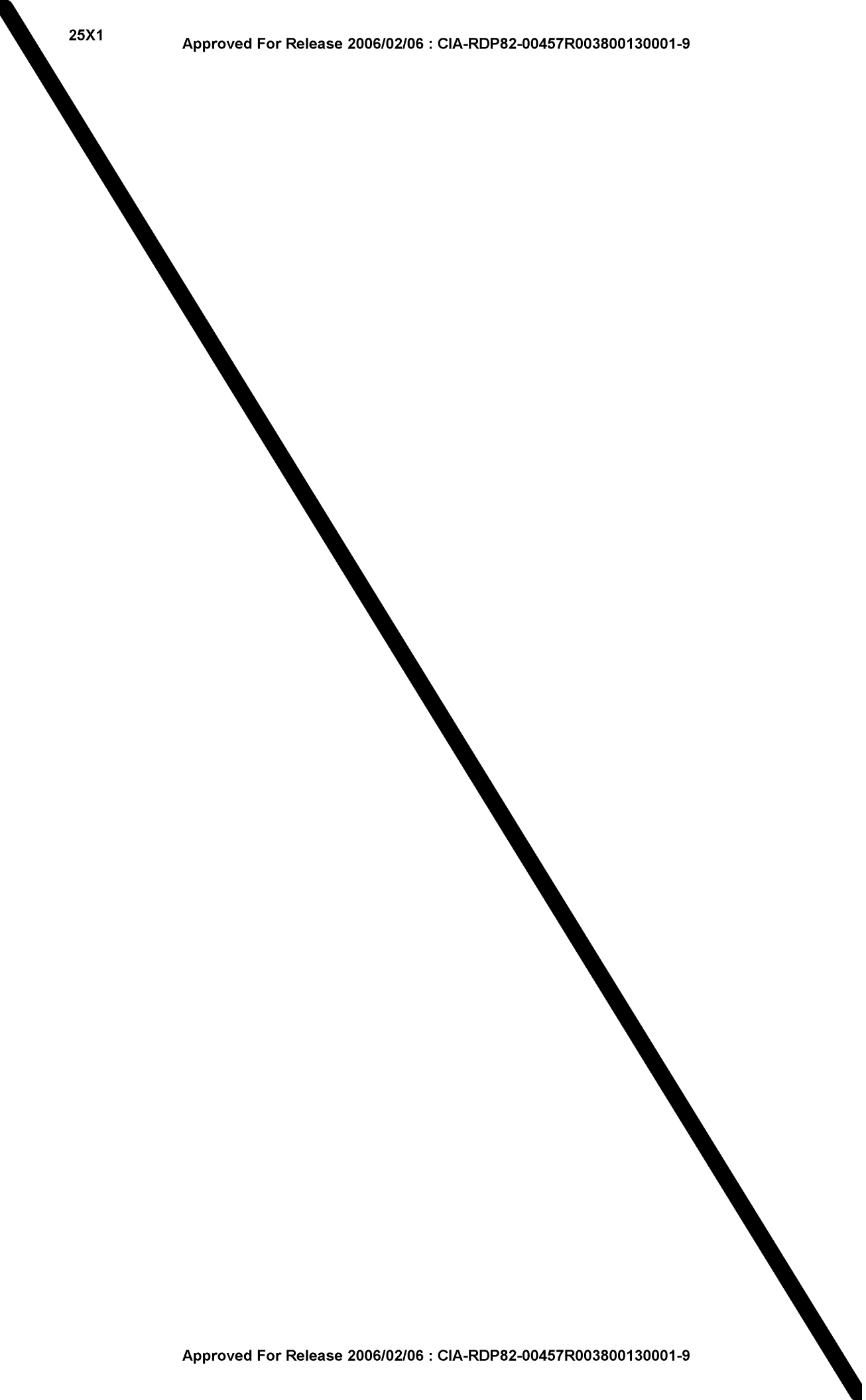

Annex 1

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Yugoslavian Railways

Scale 1:1,000,000

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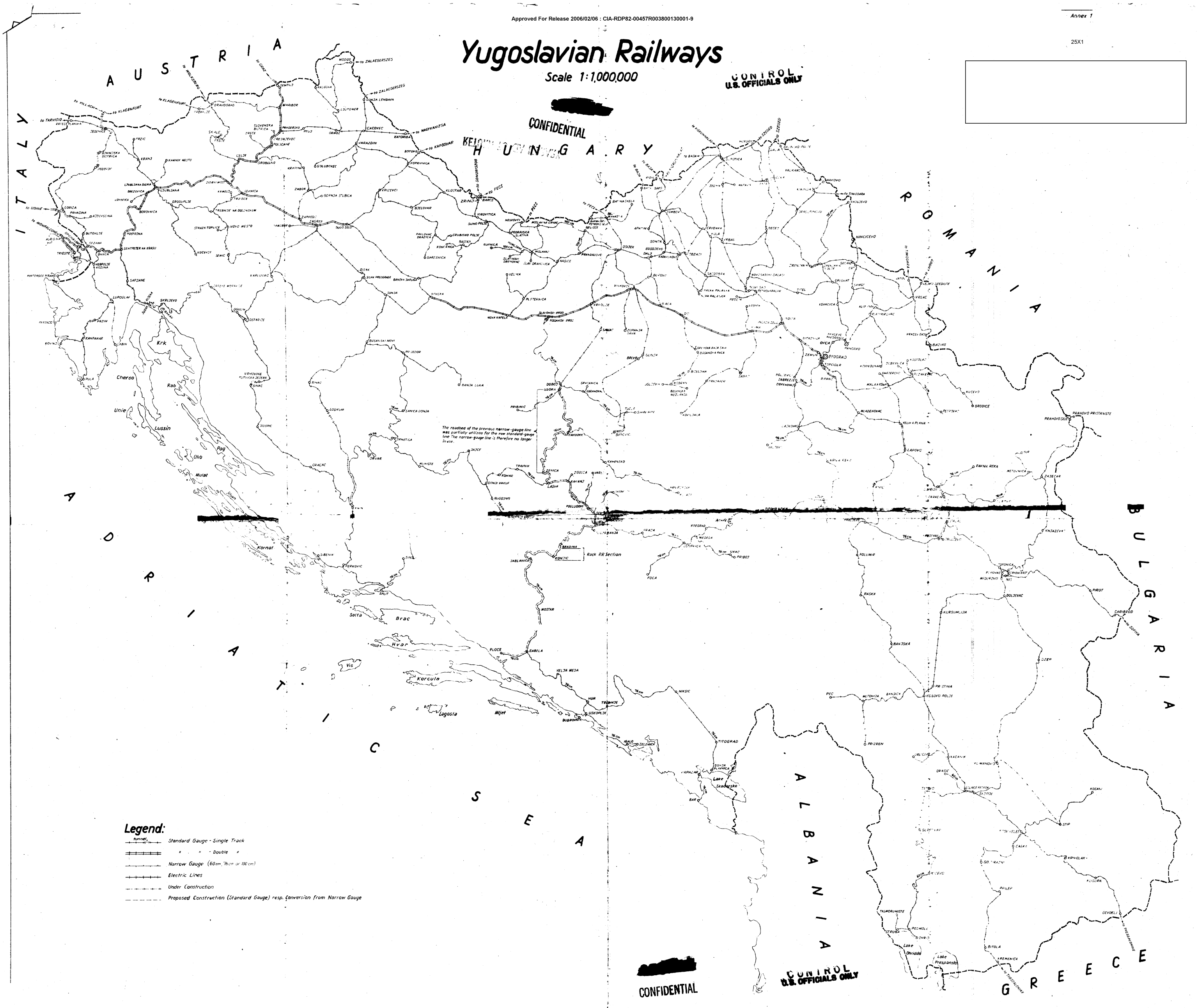

Legend:

- Standard Gauge - Single Track
- " " - Double "
- Narrow Gauge (60cm, 76cm or 100cm)
- Electric Lines
- Under Construction
- Proposed Construction (Standard Gauge) resp. Conversion from Narrow Gauge

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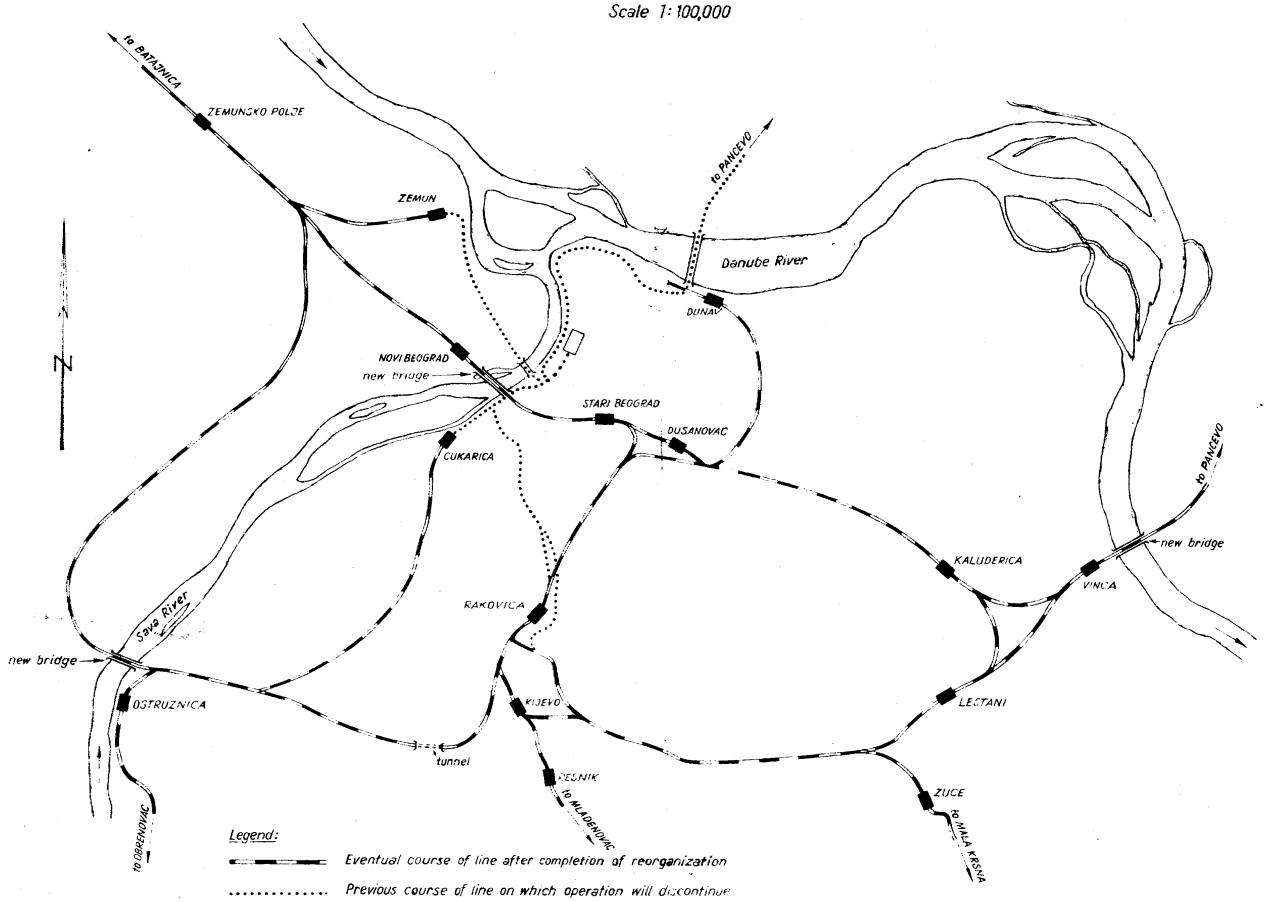
Annex 2

Reorganization of the BEOGRAD RR Junction

Scale 1: 100,000



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